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TRACHOMA.

A SURVEY OF ITS PREVALENCE IN THE MOUNTAIN SECTIONS OF VIRGINIA AND WEST VIRGINIA.

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The undue prevalence of trachoma in certain of the mountain counties of eastern Kentucky was clearly shown in the reports of surveys of that region by Dr. J. A. Stucky, of Lexington, Ky., and Surg. John McMullen of the United States Public Health Service.¹

As soon as these reports were made the advisability of making a survey of the whole Appalachian mountain chain to determine the extent of the spread of trachoma among a population allied by blood and affected by propinquity to the people of this heavily infected territory became apparent.

Extent of Survey.

Beginning in September, 1913, at Wheeling, W. Va., with an examination of the school children of that city for trachoma, inspections were made in 23 counties of West Virginia, during which 20,848 persons were examined, among whom 340 cases of trachoma were found, 1.63 per cent.

The survey of the mountainous sections of Virginia was ended at Staunton, Va., April 29, 1914. In the course of the survey 10 counties, contiguous to the known infected territory of Kentucky and West Virginia, were visited and 7,801 persons were examined for trachoma. Of these, 108 had the disease, 1.38 per cent.

TABLE 1.—*Showing number of persons examined and of cases of trachoma found in counties of West Virginia visited.*

County.	Number examined.	Cases of trachoma.	Per cent of infection.
Boone.....	297	10	3.36
Cabell.....	2,947	36	1.22
Fayette.....	1,638	9	.54
Grant.....	35	0	.....
Greenbrier.....	435	0	.....
Hampshire.....	300	14	.....
Hardy.....	70	0	.....
Kanawha.....	2,662	28	1.05
Logan.....	1,078	27	2.50
Marshall.....	1,195	26	.....
Mason.....	273	1	.36
McDowell.....	703	20	2.84
Mercer.....	2,153	9	.41
Mingo.....	781	37	4.73
Monroe.....	32	0	.....
Ohio.....	2,224	1	.....
Pendleton.....	45	0	.....
Pocahontas.....	171	0	.....
Raleigh.....	311	3	.96
Summers.....	756	2	.26
Wayne.....	1,001	59	5.89
Wood.....	1,269	8	.63
Wyoming.....	472	80	19.94
Total.....	20,848	340	1.63

¹ Public Health Reports, vol. 27, No. 45, Nov. 8, 1912.

² In State institutions.

TABLE 2.—*Showing number of persons examined and of cases of trachoma found in counties of Virginia visited.*

County.	Number examined.	Cases of trachoma.	Per cent of infection.
Augusta.....	1,210	19	0.74
Buchanan.....	261	34	13.02
Carroll.....	249	0	.....
Dickenson.....	358	20	5.58
Grayson.....	1,060	3	.28
Lee.....	842	6	.71
Scott.....	504	5	.99
Smyth.....	392	0	.....
Washington.....	1,256	5	.39
Wise.....	1,669	26	1.55
Total.....	7,801	108	1.38

¹ In State institutions.

A significant fact revealed by this survey is the wide distribution of trachomatous infection throughout the greater portion of West Virginia, from Parkersburg, in Wood County, on the northwestern border of the State, south and east to and including Mercer and Summers Counties.

On the other hand, no trachoma was found on the eastern edge of the State from Hampshire County in the north to and including Monroe County in the south.

In Virginia the heaviest infection was found in the counties adjoining West Virginia and Kentucky, in the southwestern part of the State. A sharp line of demarkation, represented by the Clinch Mountains, separates the infected territory from the other counties of this section of the State.

The infection, as in similar territory in West Virginia, is widespread in the counties where the disease was found to prevail. From a public health point of view this is one of the most important and significant facts brought to light by this survey. The wide dissemination throughout a large part of the population of the State of a disease so potentially damaging to vision as is trachoma, and the threatened economic loss to infected communities, should be a matter of serious concern to those in charge of the public health administration of these communities.

Examinations for trachoma were confined almost exclusively to the school population. Wherever it was practicable, however, a house-to-house inspection was made. This latter procedure was employed in addition to the examination of the school children at certain representative mining towns of the Cabin Creek, Paint Creek, Loup Creek, Coal River, and other mining districts of Kanawha, Fayette, and Raleigh Counties of West Virginia.

Two rural communities were also surveyed in like manner—one in Wayne County and the other in Wyoming County, W. Va. The

examination of adults in the course of this survey was largely confined to these house-to-house inspections. However, an examination of the school children of these same communities gave a corresponding trachoma index. The practice, therefore, of house-to-house inspections was discontinued because of the time consumed in making them and because sufficient additional information could not be gained thereby.

An exception to this general statement may be made with regard to the amount of visual damage. The greatest number of seriously damaged eyes is to be found among adults in cases of long standing and usually neglected trachoma.

Basis of Diagnosis.

The study of trachoma is rendered more difficult because no written description may accurately portray its clinical characteristics. The cause of the disease is yet unknown, and the use of the microscope is of no avail for routine diagnosis. The whole subject of trachoma is confused because the diagnosis is based on the clinical aspects of the disease plus the experience and personal equation of the examiner.

In order that epidemiological studies of trachoma may be of value, it is necessary to have a standard. In the course of this survey no record was kept of indeterminate or suspicious cases. Only those cases presenting hyperplastic infiltration with evidences of cicatrization were counted as trachoma. Likewise, no recovered cases with the usual cicatrization and distortion of the eyelids were used in the calculation of percentages.

Object of Survey.

The determination of the geographic distribution of infection is a prime requisite for the control of an outbreak of any communicable disease. When once the confines of an infected area have been outlined the necessary steps for the control of the disease become practicable.

The object, therefore, of this survey has not been the detection of every case of trachoma in the places visited, but to outline the limits of infected territory and to bring to the attention of local physicians, school boards, and other authorities the dangers of this disease, following its introduction into communities, and the necessity of concerted action for its eradication.

Origin of Trachoma among the Mountain Population.

No definite information could be obtained in the course of this survey as to how long trachoma has existed among these isolated people. Many and varied speculations are entertained by different persons respecting the origin of trachoma among them.

By many it is asserted the disease was introduced by recently arrived foreigners. The disease has been in these sections too long for this to be the case. During this survey a number of trachomatous subjects were met with, who declared that their grandfathers, long dead, had been blind by reason of "granulated eyelids." Surely these grandfathers were infected long before the present-day heavy immigration to this country set in, and before there was any communication between this remote people and alien races other than Anglo-Saxon.

According to Dr. Moore, of Huntington, W. Va., the disease was introduced by the soldiers under Garfield, whose army operated very extensively in those regions during the Civil War.

It is the writer's belief that trachoma has existed among these people since their earliest settlement, and that it has spread as the population increased, and because of the lack of sanitary precautions.

Damage to Vision.

The greatest number of examinations made during this survey was of school children. The amount of visual damage encountered, therefore, is not a fair index of the total amount of injury due to trachoma. An examination of a like number of adults in the same infected communities, among whom it is likely cases of long-standing trachoma exist, undoubtedly would give a higher per cent of visual injury. The longer a case of trachoma continues, the less treatment an individual case receives, the greater will be the damage to sight.

Of the 340 cases of trachoma found in West Virginia, 5.29 per cent had suffered severe visual damage. Of these, there were 10 cases of double pannus; 2 cases of pannus with blindness of one eye; 2 cases of old pannus with bare light perception; one case of blindness in a boy of 12 years with active trachoma, due to rupture of one eye, with extrusion of the contents, and to a pronounced staphyloma of the other; and 3 cases of blindness in the Institution for the Blind, which were undoubtedly caused by this disease.

Numerous cases of blindness due to trachoma were also reported by their relatives and acquaintances in the course of these examinations. The most notable was the reported blindness from trachoma of an entire family of several persons supposed to be at or near Gay, Logan County, W. Va.

In Virginia the percentage of visual damage was not found so high, due to the fact that the examinations in this State were confined almost exclusively to school children.

In the school for the blind at Staunton, Va., three cases of played-out trachoma, with marked cicatrization, were found. One of these children was undoubtedly blind from trachoma.

Trachoma in the Negro.

It is a popular belief that the negro is immune to trachoma. In the summer of 1913, Schereschewsky, of the Public Health Service, examined for trachoma the children of the Knox County Industrial School, near Knoxville, Tenn., and found 47.5 per cent of trachoma among the white children and 10 per cent among the colored children of that institution.

TABLE 3.—*Showing number of negroes examined.*

State and place.	Number examined.	Cases of trachoma.	State and place.	Number examined.	Cases of trachoma.
VIRGINIA.			WEST VIRGINIA—continued.		
Bristol.....	80	0	Dorothy.....	12	0
Marion.....	63	0	Glen Jean.....	82	0
Staunton.....	231	0	Harewood.....	57	0
WEST VIRGINIA.			Holden.....	41	0
Bluefield.....	230	0	Huntington.....	415	1
Boomer.....	11	0	Longacre.....	24	0
Burnwell.....	50	0	Marytown.....	18	0
Cabin Creek district:			Montgomery.....	84	0
South Carbon.....	9	0	Parkersburg.....	132	0
Wake Forest.....	19	0	Point Pleasant.....	32	1
Wevaco.....	18	0	Welch.....	34	0
Charleston.....	536	0	Wheeling.....	135	0
Davy.....	25	0	Total.....	2,338	2

In this survey 2,338 negroes were examined at 21 different points in the two Virginias and only two cases of trachoma were found among them. These findings agree with those of Schereschewsky to the effect that the negro is not immune to trachoma, but the amount of infection, under apparently identical conditions, undoubtedly is much less in the negro than in the white race.

In heavily infected communities visited by the writer trachoma was apparently a family disease, and seemed to be confined to certain families, while other families escaped. It does seem, therefore, that to be communicable trachoma requires an intimate contact such as is furnished by the intimacies of family life. The disease in these districts is largely confined to the white race, and the negro is probably largely protected by his inability to closely associate with whites. Furthermore, the proportionate negro population in the territory surveyed is small and may account for the comparative freedom from trachoma of this part of the general population.

Trachoma and Nationality.

The impression is quite general, in West Virginia and elsewhere, that trachoma is very prevalent among the foreign element of the population. The belief is not confirmed by this survey. Trachoma is essentially a disease of the native population. The foreigner is a

negligible factor in the continued prevalence and spread of the disease in these two States, as is shown by the following tables:

TABLE 4.—*Showing nativity of white residents in West Virginia in counties where trachoma examinations were made.*

County.	Population, 1910.	Native white popula- tion.	Mixed foreign- parent- age popu- lation.	Foreign- born white popula- tion.	Total exam- ined in county.	Trachoma cases found.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>		
Boone.....	10,331	98.0	0.4	0.1	297	10
Cabell ¹	31,161	87.6	3.8	2.0	2,947	36
Fayette.....	51,903	68.9	4.6	8.6	1,638	9
Kanawha.....	81,457	85.3	3.7	3.1	2,662	28
Logan.....	14,476	88.4	1.5	6.4	1,078	27
McDowell.....	42,794	52.6	3.6	13.1	703	20
Marshall ²					1,195	6
Mason.....	23,019	94.8	2.8	1.0	273	1
Mercer.....	38,371	79.5	1.9	3.0	2,153	9
Mingo.....	19,431	85.6	1.9	6.2	781	37
Ohio ³	41,641	53.8	30.3	14.0	2,224	1
Raleigh.....	25,633	84.3	1.8	5.9	311	3
Wayne.....	24,081	98.4	.7	.2	1,001	59
Wood.....	38,001	88.6	6.7	2.2	1,269	8
Wyoming.....	10,392	98.6	.2	.2	472	80
Total.....					19,014	334

¹ City of Huntington.

² Examination confined to inmates of State prisons.

³ City of Wheeling.

TABLE 5.—*Showing nativity of white residents of Virginia in counties where trachoma examinations were made.*

County.	Population, 1910.	Native white popula- tion.	Mixed foreign- parent- age popu- lation.	Foreign- born white popula- tion.	Total exam- ined in county.	Trachoma cases found.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>		
Buchanan.....	12,334	99.8	0.1	0.1	261	34
Carroll.....	21,116	98.5	.1	.1	249	0
Dickenson.....	9,199	99.8	.1	.1	358	20
Grayson.....	19,856	95.1	.1	.1	1,060	3
Lee.....	23,840	94.7	.2	.8	842	6
Scott.....	23,814	97.8	.1	.1	504	5
Smyth.....	20,326	94.4	.6	.2	392	0
Washington.....	39,077	90.3	.6	.3	1,256	5
Wise.....	34,162	85.5	1.9	4.2	1,669	26
Total.....					6,591	99

It was not easy to keep track of the total number examined of foreign-born persons and persons of mixed or foreign parentage. However, but four cases of trachoma were found among this element of the population examined in West Virginia, as compared with 336 cases among the native population.

Referring to Tables 4 and 5, it may be seen that the presence of trachoma among persons of foreign extraction is merely a circumstance, without relation to their number in a given community, and without any connection with the amount of trachoma found present in the resident native population.

For example, in Cabell and Kanawha Counties, where the per cent of persons of foreign birth is high, 2 per cent and 3.1 per cent, respectively, 64 cases of trachoma were found among the native population and none among the foreign.

On the other hand, in Fayette County, W. Va., with 8.6 per cent of its population foreign born, only 9 cases of trachoma were found, of which 3 cases were among foreigners, 2 of them in the family of a foreigner long resident in the county, and 1 case in the person of a Hungarian who had resided in this country for four years.

In Boone, Wayne, and Wyoming Counties, W. Va., and in Buchanan County, Va., the number of foreign-born residents is less than 0.2 per cent of the total population. Of the 183 cases of trachoma found in these four counties, all were among the resident native stock.

Observations Concerning the Spread of Trachoma.

Topography and geological formation.—In former years great emphasis was placed by writers on the influence of the local physical features of the country in the epidemiology of trachoma.

Over two-thirds of the area of West Virginia is mountainous. More than one-third of the State belongs to the Alleghany plateau. The extreme southern portion belongs to the Cumberland plateau.

In the northeastern section of the State the mountain ridges are parallel. In the southern portion the plateau has been eroded by streams, forming a succession of domes and irregular spurs extending in all directions with intervening valleys of varying width. Some of them are very narrow. These valleys are about 2,000 feet above sea level and the ridges range from 3,000 to 4,000 feet. This area is succeeded by rolling hills, in the extreme western part of the State, gradually sloping to the Ohio River, where the altitude is from 500 to 650 feet above sea level.

No possible connection could be traced, during this survey, between the physical features of the country and the amount of infection therein. The physical features of a country do, however, exert a certain influence on the customs, habits, standards of living, industries, wealth, and especially the migration of a people, and to a certain extent may bring about conditions favorable to the spread of communicable diseases.

In both the Virginias these features determine routes of travel and, therefore, the isolation of communities, both of which when applied to infected communities, are greatly concerned in the spread of trachoma. The heaviest infected communities have been found to be the most isolated in these States. From them, following routes of travel, the disease has spread widely.

Age and sex.—The greatest number of persons examined were children of school age. The following Table 6 shows, therefore, a

disproportionate amount of trachoma in children of 15 years of age and under.

TABLE 6.—*Showing trachoma cases according to age and sex of patients.*

State.	Sex.	Age (years)—						
		5 to 10	11 to 15	16 to 20	21 to 30	31 to 40	41 to 60	60+
West Virginia.....	(Male....	60	75	12	7	11	7	3
	(Female..	62	68	12	12	4	4	2
Virginia.....	(Male....	21	18	10	3	1	3	0
	(Female..	28	19	3	1	2	0	0
Total.....	(Male....	81	93	22	10	12	10	3
	(Female..	90	87	15	13	6	4	2
Grand total.....		171	180	37	23	18	14	5

The proportion of infection between the two sexes is fairly constant up to 30 years, at which age the number of cases in males preponderates. This is due to the fact that more males were examined in public places and on the roadsides.

The disease is more likely to be spread to distant places by males, and especially those who go to new territory in search of work, a practice stimulated by the industries of the State.

Illiteracy and trachoma.—An attempt was made to trace any possible connection between illiteracy and the prevalence of trachoma, assuming that illiteracy is usually associated with a disregard for and ignorance of sanitary matters.

In Logan, McDowell, and Mingo Counties, W. Va., the per cent of trachoma was high among those examined. According to the 1910 census the illiteracy rate is also correspondingly high in these counties.

In Buchanan County, Va., where the trachoma rate among those examined was 13.02 per cent, the illiteracy rate given is 34.7 per cent.

In Wyoming County, W. Va., however, where the heaviest trachomatous infection was found, 19.94 per cent of the total examined, a comparatively low illiteracy rate is given, 12.4 per cent.

The assumption was found correct, however, that illiteracy is usually associated with considerable ignorance of personal hygiene and an insanitary mode of life, and therefore with conditions favoring the spread of trachoma and other communicable diseases.

The sanitary improvement of these regions can be brought about only through education of the rising generations. Education must be an important feature among measures intended for the control of trachoma and other communicable diseases. It is pleasing to note that evidences of increasing activity in matters educational were observed in all the places visited in the course of this survey.

Type of trachoma and other related factors.—The type of trachoma met with among the people of the two Virginias did not, as a whole,

appear so severe as that reported by McMullen in Kentucky or found prevailing among the Indians of the United States. In many instances those examined expressed surprise that they had any serious eye affection and were apparently unaware of its presence. Yet these cases showed abundant conjunctival infiltration and so-called granulations with evidences of cicatrization.

Trachoma of this type is dangerous from an epidemiological standpoint, because the disease is neither detected nor suspected unless looked for specifically. Eyes in this condition are from time to time discharging the contents of broken-down "granulations," which may be the source of infection to others. Many of these cases undergo acute exacerbations. A severe inflammation may supervene at any time, due apparently to trifling causes, from which the time of the onset of the disease is usually referred.

Systematic eye examinations in infected territory is, indeed, not alone for the detection of these obscure cases, but in order that they may receive early treatment.

Furthermore, recruiting officers of the military services should bear in mind the possible presence of trachoma among applicants for enlistment at stations located in infected territory.

The contagiousness of trachoma is quite clearly shown by this survey. The disease is most prevalent in isolated communities, far from medical attention and indifferent to the same, except in sudden and grave infections. Until recently but little effort has been made to control the disease. As a result it is not uncommon to find instances where the infection has spread from one person to another in the same family. So assuredly is this the case that the mention of a certain creek in an infected district will suggest the name of some family dwelling thereon from which the disease has spread extensively.

In some communities every family of a common name was infected. In individual families the infection varied from two or more members to the whole family. In several instances the source of family infection had been definitely traced to a previous more or less protracted visit of some person subsequently known to have been affected with trachoma.

In a number of communities the question of poverty entered less into the consideration of the cause of the spread of trachoma than did the personal habits and mental attitude of a considerable number of the people.

In some sections of both States a number of the mountain people receive rentals for gas, oil, and mineral rights which are a source of considerable revenue. Yet the sanitary condition of the homes of some of them is quite as bad as of those without such income. The

common towel was everywhere present and overcrowding was frequently observed.

On account of the fact that transportation facilities are very poor in the remote districts and the roads are rough and mountainous, increasing the isolation of families and small communities, medical services are available only at rare intervals. Where such facilities are lacking the disease remains longer infectious, and the damage to vision is greatest. Indeed, the majority of these people do not realize that trachoma is infectious, and where intelligent medical advice is lacking it is allowed to spread among them unchecked.

This survey has revealed, with notable exceptions, a marked lack of appreciation of the gravity of the trachoma situation by local physicians of certain communities. Many physicians apparently were unable to detect trachoma except in its advanced stages, where a cure is well nigh impossible. A few physicians frankly admitted lack of knowledge of the disease, but nearly all expressed an earnest desire for information. For these reasons many trachomatous subjects travel to the larger towns for treatment by specialists they can ill afford to employ, and in so doing are liable to spread trachoma to fellow travelers on trains, in railroad stations, and in the cheaper hotels and boarding houses where the common towel is still in evidence.

Mining industry.—Over two-thirds of the area of West Virginia is underlaid by coal deposits, and more and more coal properties are being developed each year. The mines attract labor from their immediate vicinity and from a distance. By reason of the topography of the country mining settlements are usually congested and crowded into narrow mountain valleys, with scarcely room for the railroad, the public road, and the usual stream. The crowding together of dwellings and consequent intimate commingling of the population undoubtedly facilitate the spread of trachoma wherever introduced. Practically every adult trachoma case found in a house-to-house canvas of several mining locations originated elsewhere.

The results of the survey of Fayette, Kanawha (not including Charleston), and Raleigh Counties, 0.54 per cent, 1.96 per cent, and 0.96 per cent, respectively, are representative of the trachoma situation in mining settlements located in territory not in itself heavily infected. These results were obtained by a house-to-house inspection, in addition to the usual school examinations, in locations solely devoted to the mining industry.

The high per cent of trachoma found in Logan, McDowell, and Mingo Counties, 2.50, 2.84, and 4.73, respectively, is due to the location of the mines in a territory in which the population is already widely infected with trachoma or in locations contiguous to such infected regions.

In Wayne and Wyoming Counties, W. Va., and Buchanan and Dickenson Counties, Va., on the other hand, the extensive prevalence of trachoma, represented by 5.89 per cent, 19.94 per cent, 13.02 per cent, and 5.58 per cent, respectively, is among a distinctively rural population, in which the mining industry is but little developed.

The possibility of trachoma among the mining population is, therefore, largely a matter of location, and the degree of prevalence is determined by the amount of the disease in the territory wherein these operations are conducted.

The heterogeneous collection of miners, with their families, from all parts of the State, including infected territory and from other States may result in the dissemination of trachoma through the observed tendency of miners to drift from one location to another.

The sanitary condition of the miners' homes in most of the locations visited is no better than that of the mountain cabin whence so many of them came, and they have the additional drawback of being situated in very congested communities.

The situation, however, has distinct advantages. Cases of trachoma occurring among them are no longer isolated. Infected families, removed from remote mountain communities, are brought in touch with what is practically free medical attention. With the opening up of more and more mining locations the trachoma of the State will become more and more concentrated into communities where it can be gotten at and treated appropriately.

School inspections.—In all, 199 public and private schools were inspected during this survey, 68 in Virginia and 131 in West Virginia. Of these, 22 were schools for colored children. In addition, the schools for the blind and for the deaf and dumb at Romney, W. Va., and at Staunton, Va., were inspected, and also the inmates of the West Virginia State Prison, at Moundsville.

In most of the places visited this inspection was the pioneer work in this direction and excited considerable interest. It is expected these inspections will result in the establishment of a more thorough medical inspection of schools, especially in the larger cities, with particular reference to the detection of cases of trachoma for the purpose of placing them under medical supervision.

It was found in a number of places that the local authorities were unfamiliar with the best method of making examinations for trachoma. The result was that many cases of unsuspected trachoma were found in schools where a tentative medical inspection of the school children was practiced. The lesson of trachoma inspection is easily learned, and when it is applied similar conditions will no longer be met.

Health talks to school children.—By reason of a desire to arouse a popular interest in the subject of trachoma throughout infected ter-

ritory, 77 health talks were addressed to over 10,000 school children in the course of these inspections.

Furthermore, the children of these people will have better educational opportunities. The advantages of contact with the outside will be appreciated, in course of time, and will result in greater attention to personal hygiene and that of the surroundings. Operating along these lines, the coal mining industry, by removing the mountaineer from his isolation and placing him under medical supervision, will be indirectly instrumental in the reduction of trachoma.

Educational Features of the Survey.

Local physicians.—The awakened interest of local physicians promises to be a potent factor in the control of trachoma within the State. Those physicians whose attention has been invited to the trachoma situation will be on the lookout for cases of the disease, resulting in the detection of many more cases in incipient stage and the earlier application of remedial measures, with a more reasonable hope of effecting a cure and preventing the infection of others.

Conclusions.

Based on this survey the following conclusions are presented:

1. Trachoma is widely prevalent in West Virginia, and in sufficient amount to make it one of the serious public health problems of the State.
2. The area of heaviest rural infection is found in contiguous portions of Wayne, Lincoln, Boone, Wyoming, Logan, Mingo, and McDowell Counties, in West Virginia, and the northern portions of Buchanan, Dickenson, and Wise Counties, Va.
3. An examination of State institutions shows trachoma also prevalent in counties not visited.
4. The counties of the eastern edge of West Virginia appear to be free from trachoma, which is probably due to infrequent contact with people of infected territory because of no direct line of communication.
5. No systematic effort is being made to control the spread of the disease from infected territory or from place to place in the infected counties.
6. The necessity of concerted action for the suppression of trachoma is shown by 5.29 per cent of marked visual damage in the total of trachoma cases found during this survey in West Virginia.
7. Recent foreign immigration was not an element in the introduction of trachoma in the two Virginias.
8. The Negro race, in these two States, is practically free from the disease.

9. The mining industry, by attracting labor from infected localities, is a factor to be considered in the spread of trachoma.

10. The mining industry is potentially a means by which control may be exercised over trachoma in remote districts, through careful medical supervision of infected miners.

Recommendations.

1. Systematic examinations for trachoma should be made of all school children of the State.

2. All children suffering from active trachoma should be excluded from school under medical supervision until pronounced in condition to return without danger to others.

3. The expense of such medical supervision of school children should be borne by the State whenever necessary.

4. A school nurse should be employed wherever practicable, whose duty would be to visit the homes of children debarred from school by reason of trachoma and put into practice, under the physician's direction, the principles of control of the disease from the standpoint of the individual and the public.

5. A campaign of education should be instituted in infected territory through talks to school children and the distribution of printed information relative to the dangers and prophylaxis of trachoma.

6. A free hospital of inexpensive construction for the treatment of trachoma should be located at a point near the junction of Logan, Mingo, McDowell, and Wyoming Counties, W. Va.

7. A similar free hospital should be located near the junction of Buchanan and Dickenson Counties, Va.

8. The cooperation of the mining companies should be secured in order that a systematic examination of all miners may be made by their physicians, and all cases of trachoma found among them treated.

9. A systematic effort should be made to improve the sanitary condition of rural schools to the end that the dangers of school infection may be lessened.

Details of Trachoma Prevalence in Counties Visited.

In the following pages detailed information is presented in respect to trachoma prevalence as found in the counties visited.

Boone County, W. Va.—The survey of Boone County included Madison and Danville, two of the most important towns of the county; Clothier, a mining town; a circuit of 10 miles through Rock Creek Valley; and finally a drive of 15 miles from Danville to Chapmanville, Logan County.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Danville.....	Public school.....	79	0	.....
Ed Hayes.....	do.....	37	0	.....
Foster.....	do.....	34	1	2.94
Madison.....	do.....	70	2	2.85
Subdistrict No. 6.....	Washington district school.....	24	2	8.33
Turtle Creek.....	Public school.....	24	0	.....
Willow Grove.....	do.....	21	1	4.76
Miscellaneous.....	Family.....	8	4	50.00
Total.....	.....	297	10	3.36

Boone is one of the six West Virginia counties showing the highest percentage of trachoma infection.

The greatest amount of trachoma was found in Rock Creek Valley. Here trachoma was found in two schools and four cases of the disease were also seen among five members of a family residing in this valley. Two of these latter cases suffered from severe damage to vision in spite of treatment.

It is believed a more extended survey of this county along Pond River would reveal a wide distribution of the disease with a similar high prevalence.

Cabell County, W. Va.—Topographically, Cabell County differs materially from the greater part of the State of West Virginia. The mountains formed by erosion of the Appalachian Plateau are here replaced by rolling hills which gradually merge into the Ohio Valley.

The city of Huntington, situated on the Ohio River, is of comparatively recent growth. It is the site of several manufacturing interests, including the shops of the Chesapeake & Ohio Railroad. Labor has been attracted to this city by reason of these industries from different sections of the State, including communities heavily infected with trachoma. In this manner trachoma has been imported and spread undetected rather uniformly through the schools.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Huntington.....	Buffington public school.....	432	5	1.15
Do.....	Cabell public school.....	439	5	1.13
Do.....	Douglas (colored) public school.....	259	0	.....
Do.....	Ensign public school.....	399	10	2.50
Do.....	High public school.....	415	0	.....
Do.....	Holderby public school.....	611	7	1.12
Do.....	Nelson Barnett colored public school.....	80	1	1.25
Do.....	Washington public school.....	230	4	1.73
Do.....	West Virginia Colored Orphans Home.....	76	0	.....
Do.....	Miscellaneous.....	6	4	.....
Total.....	.....	2,947	36	1.22

One case of trachoma was found in a colored school at Huntington, in the person of a 10-year-old colored girl recently arrived from some place in Ohio.

The survey of Cabell County was confined to an examination of the school children of Huntington and the inmates of the West Virginia Orphans Home, about 4 miles distant. The number of cases of trachoma found among the school children suggests the necessity of continued systematic examination of the schools of the city and the proper control of all discovered cases.

Fayette County.—The survey of Fayette County was that of a mining population, or a population intimately associated with the mining industry. In this examination three elements were considered, viz: The school population, the white and colored native population, and the foreign element. The percentage of trachoma is not high—0.54 per cent of the total number examined.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Boomer.....	Public school.....	227	0	.....
Do.....	House inspection (white).....	54	2	3.70
Do.....	House inspection (colored).....	11	0	.....
Do.....	House inspection (foreign).....	115	0	.....
Clifftop.....	Public school.....	50	0	.....
Glen Jean.....	do.....	65	0	.....
Do.....	House inspection (white).....	28	0	.....
Do.....	House inspection (negro).....	82	0	.....
Do.....	House inspection (foreign).....	59	3	5.08
Harewood.....	House inspection (white).....	98	0	.....
Do.....	House inspection (negro).....	57	0	.....
Do.....	House inspection (Italian).....	40	0	.....
Landisburg.....	Public school.....	44	0	.....
Do.....	Lumber camp No. 11 (white).....	33	1	3.03
Do.....	Lumber camp No. 11 (foreign).....	60	1	1.66
Longacre.....	Public school (white).....	142	1	.70
Do.....	Public school (colored).....	24	0	.....
Montgomery.....	Public school (white).....	291	1	.34
Do.....	Public school (colored).....	84	0	.....
Do.....	University Preparatory Branch.....	74	0	.....
Total.....	.....	1,638	9	.54

Including school children, 258 negroes were examined in Fayette County without finding any trachoma. On the other hand, four cases of trachoma were found among the 274 foreigners examined, 1.4 per cent. Three of these cases were in the family of a Hungarian miner, long resident in America, at Glen Jean. The other case was in the person of a Hungarian who had been in this country four years.

The examination of Clifftop and at Landisburg was of especial interest, because of the report that the surrounding native population was largely infected with trachoma by the foreign laborers of the lumber camps in that vicinity. Only two cases of trachoma were found in a survey of these workmen, one in the person of the Hungarian referred to above, the other in that of a native of Roane County. This man said his grandfather was blind of this disease and that his brother and two of his cousins also had "sore eyes."

No case of trachoma was found among the resident native population of either Clifftop or Landisburg.

Hampshire, Hardy, Grant, Pendleton, Pocahontas, Greenbrier, and Monroe Counties, W. Va.—The seven counties, forming the eastern boundary of West Virginia, are grouped because no trachoma was found among the public-school children. There is practically no communication between these counties and the infected territory of the State, which may account for the apparent freedom of this part of the State from trachoma.

County.	Place and institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Hampshire.....	Romney public school.....	107	0	.....
Do.....	Romney Deaf and Dumb School ¹	140	1	.....
Do.....	Romney School for the Blind ¹	53	27	13.20
Hardy.....	Moorefield public school.....	70	0	.....
Grant.....	Petersburg public school.....	35	0	.....
Pendleton.....	Franklin public school.....	30	0	.....
Do.....	Mount Olive public school.....	7	0	.....
Do.....	Cave public school.....	8	0	.....
Pocahontas.....	Marlinton public school.....	171	0	.....
Greenbrier.....	Lewisburg public school.....	122	0	.....
Do.....	Ronceverte public school.....	313	0	.....
Monroe.....	Union public school.....	32	0	.....
Total.....		1,068	8	.....

¹ State institutions.² 3 active, 4 recovered.

In the school for the blind, at Romney, Hampshire County, three active and four recovered cases of trachoma were found—13.20 per cent. Of these, three cases were from Kanawha County and one each from Braxton, Cabell, Jackson, and Pleasants Counties. The one active case found among the pupils of the deaf and dumb school was from Braxton County.

Kanawha County, W. Va.—In the trachoma survey of Kanawha County, an examination was made of four public schools in Charleston; a house-to-house inspection and an examination of nine public schools of the Cabin creek mining district; an examination of the public school and a house-to-house inspection at Kayford, a representative town of the Coal creek mining district; a house-to-house inspection, white and colored, at Burnwell, of the Paint creek district.

Place.	Institution.	Number examined.	Cases of trachoma.	Percentage of trachoma.
Cabin Creek.....	Carbon, public school.....	20	0	.....
Do.....	Dacota, public school.....	54	1	1.85
Do.....	House-to-house inspection.....	228	13	5.70
Do.....	Republic, public school.....	33	0	.....
Do.....	South Carbon, public school (colored).....	9	0	.....
Do.....	Wake Forest, public school.....	44	0	.....
Do.....	Wake Forest, public school (colored).....	19	0	.....
Do.....	West Virginia No. 2, public school.....	44	0	.....
Do.....	Wevaco, public school.....	35	0	.....
Do.....	Wevaco, public school (colored).....	18	0	.....
Charleston.....	Garnet, public school (colored).....	375	0	.....
Do.....	Tiskelwah, public school.....	481	7	1.45
Do.....	Union, public school.....	588	0	.....
Do.....	Washington, public school (colored).....	161	0	.....
Kayford.....	Kayford public school.....	97	2	2.06
Do.....	House-to-house inspection.....	203	3	1.47
Paint Creek.....	Burnwell, house-to-house (white).....	203	2	.98
Do.....	Burnwell, house-to-house (colored).....	50	0	.....
Total.....		2,662	28	1.05

No trachoma was found in the public schools of the older sections of Charleston, but, in West Charleston 7 cases of trachoma were found among the 481 pupils of the Tiskelwah school, a ratio of 14 per 1,000.

West Charleston is separated from the older part of Charleston by Elk River. The manufacturing plants of the city are located here, and attract labor from all parts of the State. The population is not fixed, hence the infusion of trachoma. In Charleston proper the reverse conditions hold.

Twenty-one cases of trachoma, 1.9 per cent, were found among 1,057 members of the mining population of the county. Of these 18 cases, or 2.63 per cent, were among 684 persons observed in a house-to-house inspection. Only 3 cases were found among 373 school children, 0.8 per cent. This considerable difference is due to the very poor school attendance observed in these districts. The school population, therefore, was not thought to be representative of the general population, and, on this account, the house-to-house inspections were made.

Logan County, W. Va.—An examination for trachoma was made of 14 schools at various points in Logan County, including schools encountered en route from Madison, Boone County, to Chapmanville, Logan County, a distance of 15 miles. The schools of Logan and vicinity and those of Holden and vicinity were also examined.

Place.	Institution.	Number examined.	Cases of trachoma.	Percentage of trachoma.
Arcona.....	Public school.....	35	0	.....
Baisden.....	.....do.....	74	0	.....
Chapmanville.....	.....do.....	55	1	1.81
Clothier.....	.....do.....	32	1	3.12
Coal branch.....	.....do.....	36	1	2.77
Copperas mine.....	.....do.....	62	7	11.29
Holden.....	Public school (white).....	146	0	.....
Do.....	Public school (colored).....	41	0	.....
Lane.....	Public school.....	43	1	2.32
Logan.....	.....do.....	292	5	1.71
Do.....	Public school (West Logan).....	73	2	2.73
Mud Fork.....	Public school (Gay).....	71	4	5.63
Shepherds.....	Public school.....	13	1	7.69
Whitman Junction.....	.....do.....	50	1	2.00
Yuma.....	.....do.....	63	2	3.17
Miscellaneous.....	.....do.....	3	1	.....
Total.....	.....do.....	1,078	27	2.50

The trachoma infection in this county was found to be uniform and in considerable amount. An exceptional prevalence of the disease was found in two schools. The Mud Fork School, near Logan, had an infection of 5.6 per cent. In the Copperas Mine School, in the Holden vicinity, 11 per cent of the scholars were afflicted with trachoma.

A percentage of 5.6 of trachoma in the Mud Fork School indicates a heavy infection of the population along this branch of the Guyandotte River.

The children of the Copperas Mine School are recruited largely from native miners' families coming from the upper reaches of Trace Fork of Island Creek. The infection here is heavy, 11 per cent. These cases of trachoma are marked and of comparatively recent origin.

There is need, therefore, for prompt and energetic measures to limit the further spread of trachoma in these districts.

The infected section of Logan County thus outlined is the northern limit of an area of marked infection which includes also Wayne, Mingo, McDowell and Wyoming Counties.

Marshall County, W. Va.—An examination of the inmates of the State prison, Moundsville, Marshall County, was made with the idea that the existence of trachoma among the relatively few former residents of any particular county now confined in the State prison would be an index to the prevalence of the disease in certain sections of the State. An actual survey of the counties, so indicated, confirmed the value of this preliminary procedure.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Moundsville.....	State prison.....	1,195	6	0.57

Of the 6 cases of trachoma found among the State prisoners, 2 were from Mingo County and 1 each from Fayette, Logan, Mercer, and Wayne Counties, respectively. Referring to Table 1, it will be seen that these counties show the highest percentages of trachoma infection of any visited.

In addition, 4 cases of old, played-out trachoma were found. Two of these cases were in foreign-born persons, 1 from Ohio, and only 1 from West Virginia. Nothing, therefore, could be learned from the study of these recovered cases concerning the past prevalence of the disease within the State. The two foreign subjects had contracted the disease and recovered before arriving in this country.

Mason County, W. Va.—Point Pleasant, W. Va., is one of the oldest settlements in the State. The population changes slowly and is without intimate association with that of the rest of the State. The absence of extensive manufacturing interests is responsible for the fixed character of the population. For these reasons, in part, Point Pleasant is free from trachoma.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Point Pleasant.....	Point Pleasant graded school.....	241	0	.....
Do.....	Langston School (colored).....	32	1	3.12
Total .....	.....	273	1	.36

One of the two cases of trachoma seen in colored persons during the survey was found at this place. The infection had been contracted in another part of the State.

McDowell County, W. Va.—With the exception of the Bradshaw Creek, Davis, and Wimmer schools, the trachoma survey of McDowell County was confined to mining towns. In comparison with a similar population in neighboring counties, the trachoma rate is relatively low.

Place.	Institution.	Number examined.	Cases of trachoma.	Percent-age of trachoma.
Bradshaw Creek.....	Middle Fork public school.....	14	3	21.42
Davis.....	Public school.....	13	6	46.15
Davy.....	Public school (white).....	78	1	1.26
Do.....	Public school (colored).....	25	0	.....
Jaeger.....	Public school.....	66	1	1.51
Marytown.....	Public school (white).....	60	2	3.33
Do.....	Public school (colored).....	18	0	.....
Twin Branch.....	Public school.....	120	3	2.50
Welch.....	High school.....	93	1	1.07
Do.....	Lincoln graded school.....	159	0	.....
Do.....	Public school (colored).....	34	0	.....
Wimmer.....	Public school.....	18	2	11.11
Miscellaneous.....	.....	4	1	.....
Total.....	.....	703	20	2.84

The Bradshaw Creek, Davis, and Wimmer Schools, with a trachoma infection of 21.42, 46.15, and 11.11, are mountain schools and are situated along the southern limits of the heavily infected area which extends into Mingo, Wyoming, and adjacent counties.

The Davis School is near the headwaters of Panther Creek, the watershed of which extends into Buchanan County, Va., where a heavy trachoma infection is also found.

Local physicians report trachoma to have prevailed along Bradshaw Creek for many years, and a number of cases of blindness are reported to have occurred among the limited population.

No case of trachoma was found among the negro population or among the foreign born and people of foreign parentage.

Mercer County, W. Va.—The examinations for trachoma in Mercer County were confined to the school children of Bluefield and Princeton.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Bluefield.....	Brown Street public school (colored).....	230	0	.....
Do.....	Ellis Street public school.....	152	2	1.31
Do.....	High school.....	155	1	.64
Do.....	Ramsey Street public school.....	461	2	.43
Do.....	Stimson public school.....	99	1	1.01
Do.....	West End public school.....	442	0	.....
Princeton.....	Public school (graded).....	614	3	.48
Total.....	.....	2,153	9	.41

Bluefield, W. Va., is a town of rapid growth and of fluctuating population. The amount of trachoma found in the schools is relatively small and was forecasted by the lowered trachoma rate found

in the eastern part of McDowell, which is the next adjacent county to the west.

At Princeton, the county seat, 0.41 per cent of trachoma was found among the 614 school children examined there. These cases were fairly incipient and show that the disease is slowly spreading eastward.

Mingo County, W. Va.—The heaviest trachoma infection in Mingo County was found near the head of Jennies Creek, along Marrowbone Creek and Pigeon Creek. Jennies Creek is heavily infected throughout its extent, as shown by 35.29 per cent of trachoma in the school near its source in Mingo County, and 42.30 and 43.75 per cent of infected pupils in the Marcum and Old Fork schools in Wayne County.

The school population of Kermit is largely drawn from the Marrowbone Creek region. The large amount of trachoma in the Kermit school, 23.52 per cent, indicates a heavy infection along this creek, rounding out the infected area extending into Logan and Boone Counties.

With the exception of the Jennies Creek and Pigeon Creek schools, the examinations made in Mingo County are representative of the mining population. However, the mining population is recruited, for the most part, from the native mountain people, who doubtless brought the disease into the mining communities.

Place.	Institution.	Number examined.	Cases of trachoma	Per cent of trachoma.
Chattaroy.....	Public school.....	128	6	4.68
East Williamson.....	do.....	113	2	1.76
Jennies Creek.....	do.....	17	6	35.29
Kermit.....	do.....	51	12	23.52
Pigeon Creek.....	Rock House High School.....	35	3	8.57
Williamson.....	Public school.....	437	8	1.83
Total.....	.....	781	37	4.73

Trachoma prevails throughout Mingo County. Two of the six cases of this disease found among the inmates of the State prison were from this county. The infection along Jennies Creek, already noted, and 8.57 per cent of trachoma found in a school on Pigeon Creek, 10 miles from Williamson reveal a heavy rural infection also.

Ohio County, W. Va.—The examinations for trachoma in Ohio County were confined to the city of Wheeling.

Place.	School.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Wheeling.....	Central.....	460	0	.....
Do.....	Jefferson.....	280	0	.....
Do.....	Lincoln (colored).....	135	0	.....
Do.....	Ritchie.....	616	0	.....
Do.....	St. Alphonsus.....	528	1	.....
Do.....	St. Stanislaus.....	205	0	.....
Total.....	.....	2,224	1	.....

The only case of trachoma found was in the person of a small child in one of the parochial schools. This was an imported case and is without any epidemiological significance.

Not a case of trachoma was found among the 205 children of the St. Stanislaus Parochial School. These children are foreign born or of foreign parentage.

Raleigh County, W. Va.—Dorothy, a representative mining location of the Coal River district, Raleigh County, does not present so high a trachoma percentage as is the case in some other mining localities. The town is situated in a comparatively broad valley, with sufficient room for each house to have considerable ground space. Each house is separated from its neighbor by a fence. There is, therefore, less congestion of the population, with a lessened intimacy of contact. These improved living conditions are reflected in the comparatively low trachoma rate.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Dorothy.....	Public school (white).....	154	2	1.29
Do.....	Public school (colored).....	12	0	.....
Do.....	House-to-house inspection.....	145	1	.68
Total.....	.....	311	3	.96

Two cases of recovered trachoma were also observed at Dorothy. One of them was the half sister of a trachomatous school child and the other an adult from Boone County.

Summers County, W. Va.—Summers County is on the eastern border of the infected territory. The examinations in this county were limited to the school children of Hinton, because of the closure of the rural schools of the county at the time of this survey.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Hinton.....	Greenbrier public school.....	292	1	0.34
Do.....	High and graded school.....	328	0	.....
Do.....	Old Davis School.....	107	1	.92
Do.....	West End School.....	29	0	.....
Total.....	.....	756	2	.26

But two cases of trachoma were found at this point. Hinton is the terminus of a railroad division, is near infected territory, and has a considerable transient population. It is very necessary, therefore, that periodic examinations be made for trachoma that the disease may be kept from spreading.

Wayne County, W. Va.—The trachoma survey of Wayne County comprised an examination of the schools of Ceredo and Kenova, in the

northwestern part of the county, of Wayne, East Lynne, intermediate and surrounding points in the central portion, and of Crum and Jennies' Creek region in the southern part of the county.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Bartram's Fork.....	Public school.....	36	1	2.77
Burgess.....	do.....	34	1	2.94
Ceredo.....	do.....	277	1	0.36
Crum.....	do.....	47	7	14.89
East Lynne.....	do.....	47	1	2.12
Kenova.....	do.....	302	10	3.31
Marcum.....	do.....	26	11	42.30
Old Fork.....	do.....	16	7	43.75
Stone Coal.....	do.....	25	3	12.00
Stepp.....	do.....	15	0	-----
Twelve Pole Creek.....	House-to-house inspection.....	72	10	13.88
Wayne.....	Public school.....	86	1	1.16
Miscellaneous.....	.....	18	6	33.33
Total.....	.....	1,001	59	5.89

Trachoma was found prevailing extensively all over the county. In the northern part the trachoma per cent, 3.31, was higher at Kenova, with a comparatively new and fluctuating population than that found at Ceredo, 0.36 per cent with its old, long resident, fixed population.

The infection along Twelve Pole Creek in the central part of the county is severe.

The heaviest infection was found in the southern portion of the county adjacent to Mingo, at Crum, 14.89 per cent, and at Marcum and Old Fork Schools on Jennies Creek with 42.30 and 43.75 per cent of infected pupils, respectively.

It is of interest to note that the destructive changes in the eyes examined in this section have been the result of acute pannus. In the vicinity of East Lynne according to a house-to-house inspection, the disease seems to have run an acute course of three or more years duration leaving less infiltration of the conjunctiva than is usual in trachoma.

On the other hand the cases found in the schools are more typical of the severer types of trachoma and are likely to run a prolonged course. Owing to peculiar local conditions, a further spread of trachoma from these cases may be expected.

Wood County, W. Va.—Trachoma was found in all of the public schools examined in Parkersburg with the exception of Sumner, the school for colored children. A trachoma rate of 12 per 1,000 found in the Jefferson School, approaches closely the 16 per 1,000 rate considered alarming by foreign authorities. It behooves the city school authorities, therefore, to take the necessary steps to prevent a wide-spread infection in this school.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Parkersburg.....	Garfield public school.....	275	2	0.72
Do.....	Jefferson public school.....	398	5	1.25
Do.....	Park public school.....	464	1	.21
Do.....	Sumner public school (colored).....	132	0	.....
Total.....		1,269	8	.63

The presence of trachoma in every one of the city schools examined, with the exception noted, is indication of a wide diffusion of trachoma in the population of Parkersburg, and indicates the necessity for active measures for its prevention in the city and vicinity.

Wyoming County, W. Va.—In so far as railroad connections are concerned, Wyoming is one of the most isolated counties of the State. The trachoma infection is heavy in the western portion of the county, adjoining Logan, Mingo, and McDowell Counties.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Baileysville.....	Public school.....	36	6	16.66
Cedar Creek.....	House-to-house inspection.....	45	27	60.00
Cook Fork.....	Public school.....	9	0	.....
Edith.....	Guns Branch public school.....	24	0	.....
Jesse.....	Public graded school.....	38	2	5.26
Keyrock.....	Cook public school.....	27	2	7.40
Lick Rock.....	Public school.....	18	0	.....
Moccasin.....	do.....	14	2	14.28
Oceana.....	High school.....	51	1	1.96
Pineville.....	Public school.....	71	10	14.08
Reedy.....	Public graded school.....	25	10	40.00
Rock View.....	Public school.....	27	0	.....
Simon.....	Hannah Branch School.....	16	4	25.00
Sun Hill.....	Laurel Branch School.....	22	0	.....
Trent.....	Holly public school.....	15	3	20.00
Miscellaneous.....	Roadside, teachers, etc.....	34	13	38.23
Total.....		472	80	19.94

A very heavy infection was found in the school at Pineville, 14.08 per cent. Pineville being the county seat has more or less intimate communication with the rest of the county. The considerable number of cases of trachoma found here is not surprising.

From Pineville north, no marked prevalence of trachoma was encountered.

The heaviest infection was found in a house-to-house inspection along Cedar Creek. Every family living in this narrow valley, with the exception of two, was examined and 60 per cent of the population had trachoma. Only two of nine families were free from the disease.

The next heaviest infection was encountered in the Reedy Creek School, 40 per cent, which indicates a correspondingly heavy infection along this creek.

Wyoming County completes the eastern boundary of the heavily infected trachoma area included in Logan, Wayne, Mingo, McDowell, W. Va., and part of Buchanan County, Va.

Augusta County, Va.—The Virginia institutions for the blind and for the deaf and dumb are located in Staunton, Va. An examination of the pupils of these schools was desirable, especially of the school for the blind, to determine, if possible, the approximate amount of blindness in the State due to trachoma and localities from which cases of the disease were admitted.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Staunton.....	Baldwin Street public school.....	184	1	0.54
Do.....	Main Street public school.....	520	3	.57
Do.....	Colored public school.....	230	0	.....
Do.....	School for the blind ¹	80	1	1.25
Do.....	School for the deaf and dumb ¹	195	4	2.05
Total.....	.....	1,210	9	.74

State institutions.

In the school for the blind three recovered trachoma cases were found and one mildly active case, all of them in pupils totally blind. It can be asserted with positiveness, after a consideration of the admission histories of these cases, that trachoma was the cause of blindness in but one of them. However, the amount of structural changes in the eyelids of two others is so great and indicative of so intense trachomatous infection in the past that, in the absence of history to the contrary, they would have been considered blind from this disease. These four cases were from Giles, Warwick, Norfolk, and Campbell Counties, respectively.

Of the four cases of active trachoma found in the school for the deaf and dumb, two of them had been operated on and their eyelids were in good condition, but not recovered. These four cases were one each from King William and Sussex Counties, and two were from Wise County.

Among the school children of Staunton four cases of trachoma were observed, one in the person of a recent arrival from Maryland and the three others in natives of the town. These three cases were operated on about five years ago. The fact that no other cases of trachoma were found among 935 school children leads to the conclusion that Augusta County is not an endemic focus of trachoma infection. These cases, however, emphasize the necessity of periodic school inspections in this and other communities situated along the main routes of travel leading from infected territory.

Buchanan County, Va.—The survey of Buchanan County, Va., was quite extensive, but the total number of examinations was not great, because several of the larger schools were temporarily closed.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Blackey.....	Public school.....	38	9	23.68
Grundy.....	Presbyterian mission school.....	41	4	9.75
Hurley.....	Public school.....	27	4	14.81
Little Prater.....	do.....	60	3	5.00
Spruce Pine.....	do.....	8	3	37.50
Stone.....	do.....	24	2	8.33
Ward.....	do.....	18	0	.....
Whitewood.....	do.....	29	1	3.44
Miscellaneous.....	do.....	16	8	50.00
Total.....	.....	261	34	13.02

The county was traversed, on foot and on horseback, from Height, via Whitewood on the South, to Hurley and Blackey on the north-eastern border, thence to Matney by train. From Matney the survey was continued westward, via Grundy, into Dickenson county.

The heavy trachoma infection found at the Spruce Pine school and the Blackey and Hurley schools in the northeastern end of the county is evidence of the extension of the area of infection from the adjacent sections of Kentucky and West Virginia.

Dickenson County, Va.—The survey of Dickenson County was made in a westerly direction from Grundy, in Buchanan County, to Clintwood, the county seat, and thence southwest to Coeburn, Wise County. Schools in the vicinity of Clintwood were also examined.

Place.	Institution.	Number exam- ined.	Cases of trachoma.	Per cent of trachoma.
Bear Pen Creek.....	Fairview public school.....	21	3	14.28
Brush Creek.....	do.....	30	2	6.66
Clintwood.....	do.....	114	1	.87
Darwin.....	do.....	26	1	3.84
Fleming.....	do.....	41	0	.....
Lower Lick Fork.....	do.....	24	0	.....
Mort.....	Fallen Bridge public school.....	17	2	11.76
Nickols Gap.....	Public school.....	12	1	8.33
Tandy.....	Anderson public school.....	20	0	.....
Vicey.....	Prater public school.....	21	1	4.76
Miscellaneous.....	.....	32	9	27.50
Total.....	.....	358	20	5.58

The per cent of trachoma, 5.58, is high. The heaviest infection was found in the vicinity of Clintwood. Trachoma is very prevalent along Brush Creek, Bear Pen Creek, and Pound River, the headwaters of which are in Wise County.

Only a small proportion of the rural population is represented in the schools. Especially is this true in badly infected territory, where, it seemed, the greatest number of children of school age were not attending school. For this reason, therefore, the prevalence of trachoma among this population is believed to be higher than shown by the examination of the school children.

Lee County, Va.—Not as much trachoma was found in Lee County as was expected from the proximity to the infected territory of Kentucky and Tennessee. The survey of this county was extensive, from Ewing, near the Tennessee line, eastward by way of Jonesville, the county seat, to the border of Wise County.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Ben Hur.....	Public school.....	26	1	3.84
Dry Branch.....	do.....	40	3	7.50
Dryden.....	do.....	123	1	.81
Ewing.....	Cumberland High School.....	125	0	.....
Jonesville.....	Public school.....	187	0	.....
Kane Creek.....	do.....	30	0	.....
Pennington Gap.....	do.....	187	1	.53
Pleasant View.....	do.....	74	0	.....
Rose Hill.....	do.....	50	0	.....
Total.....	.....	842	6	.71

The western end of Lee County is shut off from Kentucky by the Cumberland Mountains. The country is open and adapted to agriculture. The farms are extensive and the homes of this section are commodious. No trachoma was found in this portion of the county.

In a small school at Dry Branch, between Pennington Gap and Dryden, three cases of trachoma were found, but all confined to one family. The teacher also reported two other children of another family absent from school on account of "sore eyes," which was probably trachoma.

It was found that trachoma prevailed more extensively in the hilly mining section of the county, bordering Wise and Scott Counties.

Scott County, Va.—The prevalence of trachoma in Scott County was foreshadowed by the finding of trachomatous children in the schools of neighboring counties who had been recently residents of Scott.

The amount of infection is not great, 0.99 per cent, and seems to be localized.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Duffield.....	Public school.....	13	0	.....
Gate City.....	do.....	210	1	0.47
Hortons Summit.....	do.....	35	2	5.71
Pattonville.....	do.....	67	0	.....
Rye Cove.....	do.....	128	1	.78
Tunnel Hill.....	do.....	51	1	1.90
Total.....	.....	504	5	.99

Washington, Smyth, Grayson, and Carroll Counties, Va.—Trachoma in southwestern Virginia seems largely confined to the counties north of the Clinch Mountains, which act as a natural barrier, directing

routes of travel. These four counties are considered as a group, and it is believed trachoma, as shown by this survey, is not endemic in them.

County.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Carroll.....	2 schools.....	249	0	.....
Grayson.....	12 schools.....	1,060	3	0.28
Smyth.....	2 schools.....	392	0	.....
Washington.....	8 schools.....	1,256	5	.39
Total.....	.....	2,957	8	.27

Three sporadic cases of trachoma were found in the public schools of Bristol and two in Abingdon, Washington County. These cases need no epidemiological consideration other than as a warning for border line counties to be on the lookout for infected cases. When discovered they should be properly treated to prevent the spread of trachoma to others.

A very complete survey of Grayson County, from west to east, revealed but three cases of trachoma. These cases were all in one family and are under medical supervision. The disease was contracted by this family in Texas.

The freedom from trachoma of these counties, in such proximity to infected territory separated only by a natural barrier which deflects the tide of travel, points very clearly to the fact that trachoma is a contact disease. These communities are not infected, it is very likely, because of lack of close contact with the people of infected regions.

Wise County, Va.—Trachoma is widely diffused throughout Wise County, Va. The percentage of infection ranks third among the Virginia counties visited in the course of this survey.

Place.	Institution.	Number examined.	Cases of trachoma.	Per cent of trachoma.
Appalachia.....	Public school.....	230	2	0.86
Big Stone Gap.....	do.....	294	6	2.04
Coeburn.....	do.....	344	7	2.03
East Stone Gap.....	do.....	147	4	2.78
Esserville.....	do.....	32	0	.....
Glamorgan.....	do.....	75	1	1.33
Norton.....	do.....	295	4	1.35
Wise.....	do.....	252	2	.79
Total.....	.....	1,669	26	1.55

The coal-mining industry is extensively developed and offers employment to numbers of native and foreign laborers. In addition a number of the towns are in process of evolution and are attracting residents from remote districts. We have been impressed with the

fact, during this survey, that wherever these conditions are found, conditions stimulating to frequent changes of abode on the part of many numbers of the population, a wider diffusion of trachoma has been encountered.

For example, at Wise, with a settled native population in better circumstances, but 0.79 per cent of trachoma was found.

At Glaymorgan, a mining town, and Norton, with a mixed population, native, mining, and foreign, trachoma was found to prevail to the extent of 1.33 and 1.35 per cent, respectively.

A number of cases of trachoma were found in the schools of Coeburn, Big Stone Gap, and East Stone Gap. In fact, the percentage of trachoma found therein is dangerously high, and the presence of the disease was not suspected. No better illustration of the necessity of periodic examinations of school children in infected territory for trachoma can be found than is shown here.

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